BISS Biodiversity Information Science and Standards

Biodiversity Information Science and Standards 8: e141372
doi: 10.3897/biss.8.141372

OPEN ACCESS

Conference Abstract

Environmental Impact of Digital Technologies and Artificial Intelligence

Patricia Mergen ‡, §

‡ Meise Botanic Garden, Meise, Belgium
§ Royal Museum for Central Africa, Tervuren, Belgium

Corresponding author: Patricia Mergen (patricia.mergen@plantentuinmeise.be)

Received: 08 Nov 2024 | Published: 11 Nov 2024

Citation: Mergen P (2024) Environmental Impact of Digital Technologies and Artificial Intelligence. Biodiversity Information Science and Standards 8: e141372. https://doi.org/10.3897/biss.8.141372

Abstract

Very often arguments are put forward that replacing in-person meetings by online events or using digital technologies to do collaborative research will lower the pressure on the environment (Spencer 2023). But is this actually true? The obvious impacts, such as the carbon footprint of using digital technologies, are often overlooked. The electricity (even if green alternatives exist) used to run and cool the ever-growing number of large data centers has been regularly cited (Monteclaro 2023) as the largest contributor to this impact. Recent studies (Bordage 2019), however, tend to show that other actors (mostly the users) in the domain of digital technologies, appear to have an even greater impact. Additionally, ethical considerations and habitat degradation issues resulting from mining for the components to build professional and personal digital devices contribute to the problems. The deployments of networks have also a non-negligible share in the calculation of the actual digital impact on the environement (Bordage 2019).

The tremendous increase of generated data, information exchanges, algorithms to run digital applications due to the larger use of AI in all scientific fields, in all sectors of the policy making, industry and civil society will increase the environmental impact of digital technologies even more. However, depending on the purpose of the AI technology, if its usage can demonstrate a reduction of negative environmental impacts, mitigation solutions can be envisaged. For example, if AI allows better land planning or better identification of species, it could balance out the digital environmental impact.

© Mergen P. This is an open access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

In terms of online versus in-person or hybrid meetings, the issue is not as easy as one may think. For in-person meetings, especially in topics like biodiversity information, almost everyone is using devices such as laptops, tablets or smartphones, even encouraged by the organizers and speakers, making live demos, or doing online polls requiring the use of digitial technologies (e.g., Mentimeter). Totally online meetings make heavy use of the networks, dataflows and devices, even if it can be argued that the impact of the flights is removed from the equation. Hybrid meetings combine both the impacts of fully in-person or fully online options, also encouraging local participants to interact with the online participants and potentially demultiplying the environemental impact even more. Mitigation aspects to take into account are the added value of social interactions, learning about localhost's culture and biodiversity, and input to the local economies and infrastructures to welcome business tourism for large conferences. Efforts made to make onsite meetings greener play an important role, by wisely choosing the location and how catering is handled with local products and diminishing the use of one-use-only cups and cutlery. The debate on which meeting options are the best, is far from being closed and will continue into the future.

This presentation will show recent analyses conducted, among others, by the European Institutes for Sustainable IT (information technology), to demystify common assumptions on major responsibilities in terms of environmental impact or carbon footprints of digital technologies. Tips and tricks to lower everyone's overall digital impact will be provided as well as encouraging the actors in biodiversity information to sign the Sustainable IT charter or even act further to get the highest Sustainable IT label for their institutions.

Keywords

green IT, sustainable IT, hybrid meetings, carbon footprint

Presenting author

Patricia Mergen

Presented at

SPNHC-TDWG 2024

Acknowledgements

With thanks to the Institute for Sustainable IT (ISIT)

Funding program

EU EXCELLENT SCIENCE - Research Infrastructures

Flemish Goverment : International Research Infrastructures program and structural support to EOSC (European Open Science Cloud) implementation in Flanders

Fund for Scientific Research (F.R.S.–FNRS) for the travel support

Grant title

This analysis was part of tasks within several projects. EU project BICIKL (101007492), Flemish governmental (FWO) projects DiSSCo Flanders and Flemish Open Science Board (FOSB)

Conflicts of interest

The authors have declared that no competing interests exist.

References

- Bordage F (2019) Empreinte environnementale du numérique mondial. [Environmental footprint of the digital world]. 2.0. Green IT France, 39 pp. [In EN]. URL: https://www.greenit.fr/wp-content/uploads/2019/11/GREENIT_EENM_etude_EN_accessible.pdf
- Monteclaro AJ (2023) Server Room Power Consumption: Demand and Efficiency. https://www.serverwatch.com/servers/server-room-power-consumption/. Accessed on: 2024-11-08.
- Spencer P (2023) Virtual Meetings vs In Person Meetings: Pros & Cons. https://www.davincimeetingrooms.com/blog/virtual-meetings-vs-in-person-meetings. Accessed on: 2024-11-08.